



**NEW ENGLAND  
COMMON ASSESSMENT PROGRAM**

**Released Items  
2009**

**Grade 8  
Reading**

# Reading

The dart hit the bull's-eye precisely in the center.

- 1 What does the word precisely mean as it is used in the box?
- A. exactly
  - B. scarcely
  - C. powerfully
  - D. convincingly

- 2 The prefix *inter-* in the words intermission and interview means

- A. between.
- B. connected.
- C. beneath.
- D. thorough.

*Read this article about a surprising use of X-rays. Then answer the questions that follow.*

## **X-ray Detectives**

*Carla Killough McClafferty*

- 1 Some wonderfully creative uses of X-rays have been in the world of art. X-rays themselves have influenced artists. According to an article in *Art Journal*, a group of artists in the early twentieth century known as cubists may have been partly inspired by the X-ray images they saw. Their abstract painting sometimes showed the interior of solid objects in a way similar to the way X-rays revealed hidden structures. Some of these artists used light and shadow to create skeletonlike shapes that resemble X-rays.

But the most impressive use of X-rays in art is to uncover what has been covered up. Details revealed by an X-ray of a painting can't be seen any other way. For example, in the past, paintings were often repaired if flakes of paint fell off the canvas. These repairs cannot be seen just by looking at the painting. It takes an X-ray to detect where the repairs have been made.

An X-ray of a painting is one of the best ways to tell if it was created by a famous painter or if it is a forgery. If there is a question as to whether an old master has painted a certain painting or not, X-rays are made and compared to those of paintings that are known to be genuine. If the brushstrokes, for example, are shown to be totally different than in other work done by a certain artist, then the painting is proved to be a fake.

- 4 Since modern paints are usually made from different materials than paints of hundreds of years ago, the image they leave on an X-ray film looks different. This is one way X-rays can be used to detect a forgery. A modern artist will try to make a forgery look hundreds of years old by painting dirty varnish on it or by using artificial means to get the varnish to look cracked. To the naked eye the forgery may look old, but when a careful study of the X-ray image is made, the deception is obvious.

It was common many years ago for an artist to finish a painting, decide it wasn't any good, and paint a completely different picture on top of it. Or artists would paint over others' work—it was their version of recycling. Taking an X-ray is the only way to find out if there is a picture underneath the picture you see with your eyes. Sometimes museums will be more interested in the painting beneath than the one on top, and will restore the older one by having the top layer painstakingly removed.

Forgeries of rare postage stamps, like paintings, have been detected by using X-rays. Resulting films can show details such as the design of the stamp, the type of paper used, the cancellation mark, and any alterations that might have been made.

Pieces of sculpture can also be examined by X-rays to see if they are forgeries. An X-ray film of a statue can indicate how the statue was made. If the method used by the artist was one that did not exist when the statue was supposed to have been made, it is proved to be a fake. For example, a statuette of an Egyptian cat

was thought to be thousands of years old until an X-ray image showed it was made of material that would not have been used by ancient Egyptians. X-rays help people study sculptures in other ways, too. If a metal object is covered with corrosion, an X-ray can show the actual shape of the original piece. X-rays also reveal repairs that have been made in the past that can't be seen with the eyes.



**LEFT:** One of the earliest horse sculptures by Edgar Degas, *Horse at Trough*, from the early 1860s. The figure has been formed from brown wax with red highlights and rests on a wooden base. Degas's attention to detail can be especially seen in the horse's mane, mouth, and nostrils.

**RIGHT:** An X-ray of the same sculpture shows that this attention to detail began on the inside. Degas built an intricate, almost lifelike, metal skeleton by wrapping and twisting wire before he began sculpting with wax. You can also see the nails he used to build the wooden base. Without the benefit of X-rays, we'd never be able to see the inner support for this work of art without destroying it.

- 8 X-rays' uses aren't limited to the visual arts; they are also used in the world of music. X-ray images have made it possible to understand how the internal structures of the mouth and nose work together. This information has helped professionals perfect the mouthpieces of brass instruments so musicians can achieve the best sound.

CT (computed tomography) scans have also been used to study musical instruments. A CT scanner is a complicated X-ray machine that takes many images of an object one thin slice at a time. To better understand this imaging method, think of a loaf of sliced bread. If you took one slice of bread out of the middle of the loaf, you would see what the inside of the loaf looked like at that one exact place. A CT scan enables doctors and researchers to look at numerous cross sections (the "slices") of an object in order to evaluate the whole thing (the "loaf").

Dr. Steven Sirr, a radiologist in Minneapolis, Minnesota, performs CT scans on more than his patients. He also takes these X-ray images of Stradivarius violins. The world-famous violins were made more than two hundred fifty years ago and are still considered to be the best in the world. His scans show wormholes, cracks, and even areas that were patched long ago. The films also give instrument makers a glimpse into the construction skills of the master violin makers of the past.

- 3 In the first paragraph, which information suggests that X-rays may have influenced artists?
- A. They used reverse images.
  - B. They showed inside views of subjects.
  - C. They used black and white paint.
  - D. They showed outline images of subjects.

- 4 In paragraph 4, the word deception means
- A. comparison.
  - B. openness.
  - C. trickery.
  - D. design.

- 5 What does the reader learn from the pictures and text in the box?
- A. that Degas disguised the base in a surprising way
  - B. why a metal skeleton forms a good sculpting base
  - C. the details of a genuine sculpture that was X-rayed
  - D. how Degas's sculpture was affected by corrosion

- 6 In paragraph 8, the word perfect means to
- A. insure.
  - B. continue.
  - C. extend.
  - D. improve.

- 7 Explain how X-rays can be used to discover forgeries. Use information from the **entire** article to support your answer.

8 According to the article, how are X-rays and CT scans similar?

- A. Both have influenced famous artists.
- B. Both show the interior of an object.
- C. Both have been used to reveal fake postage stamps.
- D. Both have been used to repair musical instruments.

9 Why does the author compare a CT scan to a sliced loaf of bread?

- A. to review the benefits of a CT scan
- B. to show the reader how bread is like a musical instrument
- C. to help the reader picture how a CT scan operates
- D. to explain the difference between paintings and music

10 Which sentence from the article is an **opinion**?

- A. “Some wonderfully creative uses of X-rays have been in the world of art.”
- B. “Pieces of sculpture can also be examined by X-rays to see if they are forgeries.”
- C. “X-rays also reveal repairs that have been made in the past that can’t be seen with the eyes.”
- D. “His scans show wormholes, cracks, and even areas that were patched long ago.”

11 What is the **main** purpose of the article?

- A. to persuade art dealers to check for forgeries before selling art
- B. to explain how modern technology can be used in unique ways
- C. to provide information to detectives who are looking for stolen art
- D. to help artists restore damaged artwork to its original appearance

12 Explain why “the most impressive use of X-rays in art is to uncover what has been covered up.” Use information from the article to support your answer.

# Acknowledgments

The New Hampshire, Vermont, Rhode Island, and Maine Departments of Education wish to acknowledge and credit the following authors and publishers for use of their work in the reading portion of the *New England Common Assessment Program*—2009.

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**NEW ENGLAND  
COMMON ASSESSMENT PROGRAM**

**Released Items  
Support Materials  
2009**

**Grade 8  
Reading**



**NECAP 2009 RELEASED ITEMS  
GRADE 8 READING**

**7.3.2**      **Shows breadth of vocabulary knowledge through demonstrating understanding of word meanings and relationships by** selecting appropriate words or explaining the use of words in context, including content specific vocabulary, words with multiple meanings, or precise vocabulary.

The dart hit the bull's-eye precisely in the center.

- ❶ What does the word precisely mean as it is used in the box?
- A. exactly
  - B. scarcely
  - C. powerfully
  - D. convincingly

**7.2.1**      **Students identify the meaning of unfamiliar vocabulary by** using strategies to unlock meaning (e.g., knowledge of word structure, including prefixes/suffixes, base words, common roots, or word origins; or context clues; or other resources, such as dictionaries, glossaries, thesauruses; or prior knowledge)

- ❷ The prefix *inter-* in the words intermission and interview means
- A. between.
  - B. connected.
  - C. beneath.
  - D. thorough.

## X-Ray Detectives

### Informational Text

**7.7.2** Demonstrate initial understanding of informational texts (expository and practical texts) by using information from the text to answer questions, to state the main/central ideas, or to provide supporting details

- 3 In the first paragraph, which information suggests that X-rays may have influenced artists?
- A. They used reverse images.
  - B. They showed inside views of subjects.
  - C. They used black and white paint.
  - D. They showed outline images of subjects.

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- 4 In paragraph 4, the word deception means
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  - C. trickery.
  - D. design.

## X-Ray Detectives

### Informational Text

**7.7.1 Demonstrate initial understanding of informational texts (expository and practical texts) by** obtaining information from text features (e.g., table of contents, glossary, index, transition words/phrases, transitional devices, bold or italicized text, headings, subheadings, graphic organizers, charts, graphs, or illustrations)

- 5 What does the reader learn from the pictures and text in the box?
- A. that Degas disguised the base in a surprising way
  - B. why a metal skeleton forms a good sculpting base
  - C. the details of a genuine sculpture that was X-rayed
  - D. how Degas's sculpture was affected by corrosion

**7.3.2 Shows breadth of vocabulary knowledge through demonstrating understanding of word meanings and relationships by** selecting appropriate words or explaining the use of words in context, including content specific vocabulary, words with multiple meanings, or precise vocabulary.

- 6 In paragraph 8, the word perfect means to
- A. insure.
  - B. continue.
  - C. extend.
  - D. improve.

## X-Ray Detectives

### Informational Text

**7.7.3 Demonstrate initial understanding of informational texts (expository and practical texts) by organizing information to show understanding (e.g., representing main/central ideas or details within text through charting, mapping, paraphrasing, summarizing, or comparing/contrasting)**

- 7** Explain how X-rays can be used to discover forgeries. Use information from the **entire** article to support your answer.

#### Scoring Guide:

Score	Description
4	Response provides a thorough explanation of how X-rays can be used to discover forgeries. Response includes relevant information from the article.
3	Response provides an explanation of how X-rays can be used to discover forgeries. Response includes some relevant information from the article.
2	Response provides a partial explanation of how X-rays can be used to discover forgeries. Response includes limited information from the article.
1	Response is vague or minimal.
0	Response is totally incorrect or irrelevant.
Blank	No response

#### Training Notes:

**Note:** A thorough response will include information from the entire article.

How X-ray images can detect forgeries:

By looking at X-rays of the work:

- X-rays are made of the artwork and compared to X-rays of art that is known to be genuine
  - brushstrokes
  - paint and varnish that were not used at the time the painting was supposed to have been done
- postage stamp details
  - design
  - paper type
  - cancellation mark
  - alterations
- Sculpture
  - statuette of an Egyptian cat as an example of a forgery
    - method
    - material

NECAP 2009 RELEASED ITEMS  
GRADE 8 READING

SCORE POINT 4

7 The most impressive use of an X-ray is to see the inside of something. The X-rays can help us discover forgery because we can look at the details to see if they are real. In the passage it gives examples of paintings, sculptures, or even postage stamps. When you look at a real painting you find brush strokes made by the real artist. If the brushstrokes, for example, are shown to be totally different than in other work done by a certain artist, then the painting is proved to be false. Also if an artist tries to make it look old, the deception is obvious in the X-ray. Sometimes artist would paint over other artist work, but the X-ray will show what was underneath the cover-up. The postage stamp can also be discovered of forgery because under the X-ray it shows the type of paper, the cancellation mark, or other alterations made. Sculptures can also be forged too by looking underneath the X-ray and figuring out if the type of structure or material was used during the time the sculpture was made. X-rays can also project to see if the object was covered in corrosion. X-rays help us unlock key information from art or music.

Response provides a thorough explanation of how X-rays can be used to discover forgeries. Response includes relevant information from the article.

NECAP 2009 RELEASED ITEMS  
GRADE 8 READING

SCORE POINT 3

7 X-rays can be used in many ways to discover forgeries. "An x-ray of a painting is one of the best ways to tell if it was created by a famous painter or if it is a forgery." When people x-ray a painting they can tell by brush strokes if it was made by a famous painter. They can also tell by the kind of paint. Older paint shows up differently on an x-ray than newer paint. "An x-ray film of a statue can indicate how the statue was made." X-rays can help detect forgeries in sculptures and statues too. If you take an x-ray of a statue you can see the method used to make it. If the method used is newer than previous methods then it is a forgery.

Response provides an explanation of how X-rays can be used to discover forgeries. Response includes some relevant information from the article.



NECAP 2009 RELEASED ITEMS  
GRADE 8 READING

SCORE POINT 2

7 X-rays can detect forgeries in paintings and sculptures. An x-ray can help you tell the actual age of a painting. Find out what materials were used. And even tell the difference of a brush stroke in paintings. X-rays can also be used to tell if a sculpture was made in a new technique or an old one.

Response provides a partial explanation of how X-rays can be used to discover forgeries. Response includes limited information from the article.

SCORE POINT 1

7 X-rays can be used to see if someone is faking a painting by seeing the brush stroke patterns.

Response is vague or minimal.

NECAP 2009 RELEASED ITEMS  
GRADE 8 READING

SCORE POINT 0

7

X-rays can help by X-raying humans.

Response is totally incorrect or irrelevant.



## X-Ray Detectives

### Informational Text

**7.8.1** Analyze and interpret informational text, citing evidence as appropriate by explaining connections about information *within* a text, *across* texts, or to related ideas

- 8 According to the article, how are X-rays and CT scans similar?
- A. Both have influenced famous artists.
  - B. Both show the interior of an object.
  - C. Both have been used to reveal fake postage stamps.
  - D. Both have been used to repair musical instruments.

**7.8.3** Analyze and interpret informational text, citing evidence as appropriate by drawing inference about text, including author's purpose (e.g., to inform, explain, entertain, persuade) or message; or using supporting evidence to form or evaluate opinions/judgments and assertions about the central ideas that are relevant

- 9 Why does the author compare a CT scan to a sliced loaf of bread?
- A. to review the benefits of a CT scan
  - B. to show the reader how bread is like a musical instrument
  - C. to help the reader picture how a CT scan operates
  - D. to explain the difference between paintings and music

## X-Ray Detectives

### Informational Text

**7.8.4** Analyze and interpret informational text, citing evidence as appropriate by distinguishing fact from opinion, and identifying possible bias/propaganda or conflicting information within or across texts

- 10 Which sentence from the article is an **opinion**?
- A. “Some wonderfully creative uses of X-rays have been in the world of art.”
  - B. “Pieces of sculpture can also be examined by X-rays to see if they are forgeries.”
  - C. “X-rays also reveal repairs that have been made in the past that can’t be seen with the eyes.”
  - D. “His scans show wormholes, cracks, and even areas that were patched long ago.”

**7.8.3** Analyze and interpret informational text, citing evidence as appropriate by drawing inference about text, including author’s purpose (e.g., to inform, explain, entertain, persuade) or message; or using supporting evidence to form or evaluate opinions/judgments and assertions about the central ideas that are relevant

- 11 What is the **main** purpose of the article?
- A. to persuade art dealers to check for forgeries before selling art
  - B. to explain how modern technology can be used in unique ways
  - C. to provide information to detectives who are looking for stolen art
  - D. to help artists restore damaged artwork to its original appearance

## X-Ray Detectives

### Informational Text

**7.8.1** Analyze and interpret informational text, citing evidence as appropriate by explaining connections about information *within* a text, *across* texts, or to related ideas

- 12** Explain why “the most impressive use of X-rays in art is to uncover what has been covered up.” Use information from the article to support your answer.

#### Scoring Guide:

Score	Description
4	Response provides a thorough explanation of why “the most impressive use of X-rays in art is to uncover what has been covered up.” Response includes relevant information from the article.
3	Response provides an explanation of why “the most impressive use of X-rays in art is to uncover what has been covered up.” Response includes some relevant information from the article.
2	Response provides a partial explanation of why “the most impressive use of X-rays in art is to uncover what has been covered up.” Response includes limited information from the article.
1	Response is vague or minimal.
0	Response is totally incorrect or irrelevant.
Blank	No response

#### Training Notes:

Why “the most impressive use of X-rays in art is to uncover what has been covered up.”

Uncovering what has been covered up reveals many things that would otherwise not be seen:

- repairs
- style (brushstrokes for example)
- materials used
- recycled canvases can show underlying paintings
- underlying structures, e.g., sculptures
- original shape if covered with corrosion

Uncovering these things produces

- guidance for repairs
- forgeries
- history
- new artwork previously unseen

12

"The most impressive use of X-rays in art is to uncover what has been covered up" because it is simply amazing how we are able to use technology to see the things in art that were hidden. For example, we can see where repairs were made. This will help us to better understand what the original copy looked like, and maybe give us hints as to what the painting has been through. Also, artists creating fake pieces of art will attempt to cover up the differences between theirs and the original. But X-rays can see right through that. X-rays also help us to better understand how a piece was made. By finding this out, we can use this to help us make our art better by using the techniques of masters. Also, painters would paint over paintings, and we can use X-rays to see the hidden painting that may just be more spectacular than the one on top. In conclusion, X-rays being able to uncover what is covered in art is very impressive because of how complex it is to be able to do so many different things with the same invention.

Response provides a thorough explanation of why "the most impressive use of X-rays in art is to uncover what has been covered up." Response includes relevant information from the article.

NECAP 2009 RELEASED ITEMS  
GRADE 8 READING

SCORE POINT 3

12

The most impressive use of X-rays is to uncover what has been covered up because with this technology we can find out more about art and music. If a famous artist had a particular brush stroke, or a technique that only he used, an X-ray could identify this technique, and pass the information on to modern artists. This is also the most impressive use of an X-ray because if there is a hidden picture, in a picture done by an artist, the X-ray can see this and have it uncovered. The hidden picture could be a lot more interesting and more valuable than the original picture in the front. X-rays can help uncover hidden secrets in any musical instrument or painting.

Response provides an explanation of why "the most impressive use of X-rays in art is to uncover what has been covered up." Response includes some relevant information from the article.



NECAP 2009 RELEASED ITEMS  
GRADE 8 READING

SCORE POINT 2

12

The most impressive use of X-rays in art is to uncover beneath it. This is because some paintings under the top one may be very much older and/or more valuable. Back then, artists would just paint right over another painting. Some day we might discover a valuable painting that has been painted over.

Response provides a partial explanation of why "the most impressive use of X-rays in art is to uncover what has been covered up." Response includes limited information from the article.

SCORE POINT 1

12

X-rays can uncover old paintings from new ones, to see if there real or not

Response is vague or minimal.

NECAP 2009 RELEASED ITEMS  
GRADE 8 READING

SCORE POINT 0

12

you can see your bones to see if you have  
broken bones <sup>or</sup> sprained it, and crack a bone  
somewhere on your body.

Response is totally incorrect or irrelevant.

## Grade 8 Reading Released Item Information

Released Item Number	1	2	3	4	5	6	7	8	9	10	11	12
Content Strand <sup>1</sup>	WV	WV	II	WV	II	WV	II	IA	IA	IA	IA	IA
GLE Code	7-3	7-2	7-7	7-2	7-7	7-3	7-7	7-8	7-8	7-8	7-8	7-8
Depth of Knowledge Code	2	1	1	2	2	2	2	2	2	2	2	3
Item Type <sup>2</sup>	MC	MC	MC	MC	MC	MC	CR	MC	MC	MC	MC	CR
Answer Key	A	A	B	C	C	D		B	C	A	B	
Total Possible Points	1	1	1	1	1	1	4	1	1	1	1	4

<sup>1</sup>Content Strand: WV = Word ID/Vocabulary, LI = Literary/Initial Understanding, LA = Literary/Analysis & Interpretation,  
 II = Informational/Initial Understanding, IA = Informational/Analysis & Interpretation

<sup>2</sup>Item Type: MC = Multiple Choice, CR = Constructed Response